From: Chris Babcock ███████████████████████

Sent: Fri, 27 Sep 2019 22:53:58 +0000 (UTC)

To: Alec Shobin ███████████████@█████████████

Cc: Tyler Quillen ████████████@epicgames.com; Haseeb Malik ██████████████████████; Jack Porter ███████████████████

Subject: Re: Scoping FN Build for Google Play

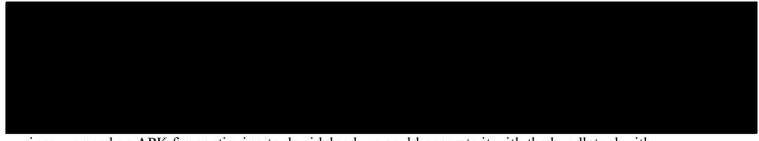Here are the areas we would need to deal with to get on Play Store:
1. We rely on the Fortnite Installer for updating the Fortnite APK
- we can use the package installer info to discover if we were installed by Google Play Store:
bool bIsGPS = AndroidThunkJava_IsPackageInstalled("com.epicgames.portal") &&
AndroidThunkJava_Fortnite_GetPackageInstaller("com.epicgames.fortnite").equals("com.android.vending");
- if so, we can try to use Google Play Store to update:
if (bIsGPS)
{
// check this url: https://play.google.com/store/apps/details?id=com.epicgames.fortnite
// if returns 200, the package exists and can launch it
// alternatively, use in-app updates with AppUpdateManager (https://developer.android.com/guide/app-bundle/in-app-updates)
// I believe there is also some code for this in BattleBreakers we could leverage
}

2. Fortnite Installer is also used for LoginId, Samsung store / preinstall tracking, and new FunnelId
- LoginId falls back to a first-run generated GUID if installer not installed so should be ok here; we just lose it if app is uninstalled
- Samsung store / preinstall state will assume sideloaded behavior for IAP behavior if installer not installed so should be fine
- FunnelId will just be blank since this is coming from an asset injected into the installer by server before it is downloaded

3. We currently use a target sdk of 21 to disable runtime permissions; Google Play Store requires a minimum of 26 (Android 8.0)
- we have the code to handle runtime permissions and can add this flow back, we might want to anyway for Dance Royale for camera permissions
- be aware doing so will bring back the "Contacts" permission issue to check for Samsung account login state (we only ask for it on Samsung devices but this is the majority); we are still waiting on Samsung's promised Android 10 API so we can avoid this

4. Our current APK size of 132 MB exceeds the Google Play Store limit of 100 MB
- we could work around this by either trimming down the APK (already identified around 7 MB we can recover), but this will be an ongoing battle to stay within the limit
- alternative is to use App Bundle feature which will allow a maximum of 150 MB for the final APK generated by the store from a maximum 500 MB bundle
- this allows stripping out unused resources by locale, display density (dpi), and architecture, we would not gain anything for Fortnite for architecture since we only ship ARM64
- will still have a ceiling of 150 MB we are likely to keep getting closer to with more updates to Fortnite
- disadvantage of bundles is having to share our keystore for signing the APK with Google
- we could use a different keystore and check for a different signature as valid, but we would run into the issue that a package name + keystore signature must match to update an existing install on a device; we would not be able to allow switching back to Fortnite Installer without forcing user to uninstall first and losing any local configuration / login info stored
- another issue for using App Bundle is the APK will not be the same as our sideloaded version since it is

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- since we need an APK for continuing to do sideload we could generate it with the bundletool with --mode=universal (see https://developer.android.com/studio/command-line/bundletool and https://github.com/google/bundletool)

Step 4 is the longest task.

Chris

On Fri, Sep 27, 2019 at 1:57 PM Alec Shobin ■■■■■■■■■■■■■■■■■■■■ wrote:

> I'll set it up. Thanks!

On Fri, Sep 27, 2019 at 1:55 PM Tyler Quillen ■■■■■■■■■■■■■■■■■ wrote:

> With Chris's update coming in, can we set up an early meeting next week to align before you have an official update to Tim. Preferably **early morning** so Jack can attend.
> An internal kick-off of sorts to ensure we are all on the same page and setting ourselves up for success.

On Fri, Sep 27, 2019 at 1:07 PM Haseeb Malik ■■■■■■■■■■■■■■■■■ wrote:

> It's not ASAP level critical, but we do need to size the effort and provide a timeline. This should account for the "What would it take to get done [timeframe] eg. next month, this year?" question from Tim.

On Fri, Sep 27, 2019 at 12:59 PM Tyler Quillen ■■■■■■■■■■■■■■■■■ wrote:

> Chris is going to have a conversation with Anti-Cheat today regarding some of our logistical concerns and then he will provide a more thorough breakdown of the work required here in order of magnitude. Do we have any high level timeline expected from Tim? We are coming in hot to S11 FN and 4.24 Feature complete this week and the next. Worried if we try to rush this in a.s.a.p. we are going to slip somewhere and this sounds like an effort that is going to require some finesse to get right the first time.

On Fri, Sep 27, 2019 at 11:51 AM Haseeb Malik ■■■■■■■■■■■■■■■■■ wrote:

> Thanks Jack, I will add representatives for those groups to the synch.
> Yes, there was a talk about Kairos + FN Installer, and even just Kairos. Ed and MarkR went out to Google to pitch it. Long story short there was a legal hurdle. There are two main clauses that prohibit the use of Google Play to 'sell away' from the Play store. Both 4.5 and 4.9 in the Developer Distribution Agreement blocks the use of an app to distribute or collecting user information to do so. Netflix, Amazon, Spotify circumvent the GP store by having links that go directly to a user's account management page.
> **Google Play Developer Distribution Agreement**
>
> 4.5 **You may not use Google Play to distribute or make available any Product that has a purpose that facilitates the distribution of software applications and games for use on Android devices outside of Google Play.**
>
> 4.9 You will not engage in any activity with Google Play, including making Your Products available via Google Play, that interferes with, disrupts, damages, or accesses in an unauthorized

manner the devices, servers, networks, or other properties or services of any third party including, but not limited to, Google or any Authorized Provider. **You may not use user information obtained via Google Play to sell or distribute Products outside of Google Play.**
Source: https://play.google.com/intl/ALL_us/about/developer-distribution-agreement.html

Now we are going another route and the goal is draw Google into a legal battle over anti-trust. Once we are ready to submit, Epic will announce publicly that we are going to Google Play. If we are rejected for only offering Epic's payment solution. The battle begins. It's going to be fun!

Thanks for helping, if you could help me with a ballpark on time to submit/launch, Id like to start setting some expectations with teams.

Thanks!

On Fri, Sep 27, 2019 at 11:39 AM Jack Porter ██████████████████████████ wrote:

> Anticheat, Kairos and the Portal/Android installer team needs to be included. There are a bunch of issues that will impact them, for example some more issues that have come up recently:
> - Can we use the same apk for Google Play and the Installer?
> - App bundles would mean handing signing off to Google Play and this may cause issues validating the ████████████████████████████
> - Are builds installed by Google Play updateable by the Installer, eg can our users who used the Play Store build continue to update even if Google pulls the plug and remove us from the Play Store?
> - What can we do about the UX being unable to filter users only on compatible devices using the Google Play store, leading to disappointed users blocked after downloading.

A Fortnite Play Store build is doable but there are a number of caveats and rough edges that we need to fully map out and report back.

As a side node, have we considered a Kairos + Fortnite Installer Play Store build? That could both expand Kairos to lower end phones and could potentially be simpler.

- Jack

On Sat, Sep 28, 2019 at 12:26 AM Haseeb Malik ████████████████████████████ wrote:

> Re-surfacing this to the top of your respective inboxes. Who outside of this group needs to be involved with preparing the build for Google Play? This would include the payment registration flow UX etc. The directive is from TimS and we are due for an update next week. A separate thread with legal has already kicked off with Canon.
> We will kickoff a weekly synch on this to get the right people in the room.

I appreciate your help here.

Thanks!

On Tue, Sep 24, 2019 at 6:31 PM Alec Shobin ████████████████████████████ wrote:

> Great breakdown, thanks for sharing all the details.
> 1. REDACTED FOR PRIVILEGE
> 2. If we wanted to figure out how long it would take to do the work above, or rough out a timeline, who else would need to be involved? Does this span other teams besides anti cheat?

Thanks again for all the info. Sounds like a very involved project so want to make sure I'm talking to all the right people.

+Haseeb Malik for vis

On Tue, Sep 24, 2019 at 6:23 PM Chris Babcock █████████████████████████ wrote:

One more point: to use App Bundles we have to turn over the keystore file to Google's control so ███

Lastly, we've been adding a feature to download serial-numbered APK builds that are unique on Android with our installer/backend, too, and cannot do that with Google Store.

Chris Babcock

On Sep 24, 2019, at 6:11 PM, Chris Babcock █████████████████████████ wrote:

> This would be quite a bit of work to put Fortnite itself on the store:
> 1. We disabled runtime permissions and deliberately use an old target SDK which Google Play Store does not allow.

2. With our own installer we are not limited in the APK size; we currently exceed supported size. App bundles may get us some more room but we're already approaching that limit, too.

3. We rely on Fortnite Installer for analytic and funnel id tracking.

4. We use the Fortnite Installer for updating.

To put the Fortnite Installer instead would be easier but it would still have to sideload so we would not get any advantage of easier install (user would still have to enable installing like we do for Chrome install).

Are you sure about bypassing the 30%?   REDACTED FOR PRIVILEGE

REDACTED FOR PRIVILEGE

Chris

On Sep 24, 2019, at 5:33 PM, Alec Shobin ████████████████ wrote:

> Hey Jack, Chris and Tyler,
> Do you know how long it would take to make a build of FN that could function on Google Play but only support our existing payment methods?
> How would that user flow differ compared to normal Google Play apps?

For context, Store team was briefing Tim on the changes to the Android Installer needed to support more games - he asked them to scope out what it would take to make the build I described above (it gets around their 30% revshare cut). I believe someone said it would take 6 months. However, the store team aren't the folks that would do this, right? Wouldn't it be you guys? And maybe you could do it faster?

Let me know what you think, this could be pretty awesome and I'm eager to see how I can help.

Thanks,

-Alec

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Alec Shobin
Publishing, Mobile | Epic Games

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Alec Shobin
Publishing, Mobile | Epic Games

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Haseeb Malik
Marketing Director
Mobile Publishing | Epic Games

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Haseeb Malik
Marketing Director
Mobile Publishing | Epic Games

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Thank you,
Tyler Quillen
Associate Producer | Unreal Engine | Epic Games, Inc.

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Haseeb Malik
Marketing Director
Mobile Publishing | Epic Games

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Thank you,
Tyler Quillen
Associate Producer | Unreal Engine | Epic Games, Inc.

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Alec Shobin
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